

**ABSTRACT OF THE DISCLOSURE**

[0082] A single crystal ceramic material for optical and optoelectronic applications is provided, including a single crystal spinel having a general formula  $aAD \cdot bE_2D_3$ , wherein A is selected from the group consisting of Mg, Ca, Zn, Mn, Ba, Sr, Cd, Fe, and combinations thereof, E is selected from the group consisting Al, In, Cr, Sc, Lu, Fe, and combinations thereof, and D is selected from the group consisting O, S, Se, and combinations thereof. A ratio  $b:a > 1:1$  such that the spinel is rich in  $E_2D_3$ , and the single crystal spinel is formed by a melt process